#11/18

SEQUENCE LISTING

(1) GENERAL INFORMATION:

(i) APPLICANT: Wild, Hanno; Hanko, Rudolf; Dorschug, Michael;

Horlein, Hans-Dietrich; Beunink, Jurgen;

Apeler, Heiner; Wehlmann, Hermann; and Sebald,

Walter

(ii) TITLE OF INVENTION: HIL-4 MUTANT PROTEINS USED AS

ANTAGONISTS OR PARTIAL AGONISTS OF

HUMAN INTERLEUKIN 4

(iii) NUMBER OF SEQUENCES: 20

(iv) CORRESPONDENCE ADDRESS:

(A) ADDRESSEE: Sprung Kramer Schaefer & Briscoe

(B) STREET: 660 White Plains Road

(C) CITY: Tarrytown

(D) STATE: New York

(E) COUNTRY: USA

(F) ZIP: 10591-5144

(v) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: Diskette, 3.50 inch, 1.4 Mb storage

(B) COMPUTER: Apple Macintosh

(C) OPERATING SYSTEM: System 7.5

(D) SOFTWARE: WordPerfect 3.5

(vi) CURRENT APPLICATION DATA:

(A) APPLICATION NUMBER: 08/765,012

(B) FILING DATE: 19-DEC-1996

(C) CLASSIFICATION:

(vii) PRIOR APPLICATION DATA:

(A) APPLICATION NUMBER: PCT/EP95/02358

(B) FILING DATE: 19-JUN-1995

(vii) PRIOR APPLICATION DATA:

(A) APPLICATION NUMBER: DE 44 23 131

(B) FILING DATE: 01-JUL-1994

(viii) ATTORNEY/AGENT INFORMATION:

(A) NAME: Kurt G. Briscoe

(B) REGISTRATION NUMBER: 33,141

(C) REFERENCE/DOCKET NUMBER: BAYER 9776-KGB

(ix) TELECOMMUNICATION INFORMATION:

(A) TELEPHONE: (914) 332-1700

(B) TELEFAX: (914) 332-1844

(2) INFORMATION FOR SEQ ID NO: 1:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 16 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(iii) HYPOTHETICAL: no

+7,0290

9

	ANTI-SENSE: no ORIGINAL SOURCE: (C) INDIVIDUAL ISOLATE: synthetic	
(xi)	SEQUENCE DESCRIPTION: SEQ ID NO: 1:	
CATG	CACAAG TGCGAT	16
	 (2) INFORMATION FOR SEQ ID NO: 2: SEQUENCE CHARACTERISTICS: (A) LENGTH: 12 base pairs (B) TYPE: nucleic acid (C) STRANDEDNESS: single 	
	(D) TOPOLOGY: linear MOLECULE TYPE: cDNA) HYPOTHETICAL: no	
	ANTI-SENSE: no	
(vi)	ORIGINAL SOURCE:	
(xi)	(C) INDIVIDUAL ISOLATE: synthetic SEQUENCE DESCRIPTION: SEQ ID NO: 2:	
(211)	DIQUINCI DISCRIFTION. DIQ ID NO. 2.	
ATCG	CACTTG TG	12
	(2) INFORMATION FOR SEQ ID NO: 3:	
(i)	SEQUENCE CHARACTERISTICS: (A) LENGTH: 21 base pairs (B) TYPE: nucleic acid (C) STRANDEDNESS: single	
(ii)	(D) TOPOLOGY: linear MOLECULE TYPE: cDNA	
) HYPOTHETICAL: no	
	ANTI-SENSE: no	
(vi)	ORIGINAL SOURCE:	
	(C) INDIVIDUAL ISOLATE: synthetic	
(X1)	SEQUENCE DESCRIPTION: SEQ ID NO: 3:	
GCCT	CCAAGG ACACAACTGA G	21
	(2) INFORMATION FOR SEQ ID NO: 4:	
(i)		
(ii)	MOLECULE TYPE: cDNA	
(iii)) HYPOTHETICAL: no	
	ANTI-SENSE: no	
(vi)	ORIGINAL SOURCE:	
(n== \	(C) INDIVIDUAL ISOLATE: synthetic	
1 X 7 1	SECUENCE DESCRIPTION: SEO III NO: 4:	



GTGE	AAGGA	AAG (CGA	JCAGA	AG 17	ACG							24
(ii) (iii	SE((A (B (C (D MOI	QUEN() L1) T') T() T(LECUI (POTI	CE CI ENGTI YPE: TRANI OPOLO LE TY	HARACH: 30 nuc: DEDNI DGY: YPE: CAL:	CTERI 6 bas leic ESS: lin cDN	ISTIC se po acio sing ear	airs d	D NO	: 5:				
		ri-si IGINA		: no DURCE	Ξ:								
(xi)							re: s se(
CTGC	GAGA	CTG (CCATO	GCCC	CA CZ	AAGT(GCGA:	r ATC	CACC				36
	SE((A (B (D	QUENC) Li) T') T(CE CH ENGTI YPE: OPOLO	HARA(H: 1: ami: OGY:	CTERI 31 am no a 1in	ISTIO mino cid ear	EQ II CS: acio SE(ds		6:			
Met	Ala	His 1	Lys	Cys	Asp	Ile 5	Thr	Leu	Gln	Glu			
Ile 10	Ile	Lys	Thr	Leu	Asn 15	Ser	Leu	Thr	Glu				
Gln 20	Lys	Thr	Leu	Cys	Thr 25	Glu	Leu	Thr	Val				
Thr 30	Asp	Ile	Phe	Ala	Ala 35	Ser	Lys	Asn	Thr				1
Thr 40	Glu	Asn	Glu	Thr	Phe 45	Cys	Àrg	Ala	Ala				
Thr 50	Val	Leu	Arg	Gln	Phe 55	Tyr	Ser	His	His				
Glu 60	Lys	Asp	Thr	Arg	Cys 65	Leu	Gly	Ala	Thr				
Ala 70	Gln	Gln	Phe	His	Arg 75	His	Lys	Gln	Leu				



Ile Arg Phe Leu Lys Arg Leu Asp Arg Asn 80 85

Leu Trp Gly Leu Ala Gly Leu Asn Ser Cys 90 95

Pro Val Lys Glu Ala Asn Gln Ser Thr Leu 100 105

Glu Asn Phe Leu Glu Arg Leu Lys Thr Ile 110 115

Met Arg Glu Lys Asp Ser Lys Cys Ser Ser 120 125

- (2) INFORMATION FOR SEQ ID NO: 7:
- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 131 amino acids
 - (B) TYPE: amino acid
 - (D) TOPOLOGY: linear
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 7:

Met Ala His Lys Cys Asp Ile Thr Leu Gln Glu 1 5

Ile Ile Lys Thr Leu Asn Ser Leu Thr Glu 10 15

Gln Lys Thr Leu Cys Thr Glu Leu Thr Val 20 25

Thr Asp Ile Phe Ala Ala Ser Lys Asn Thr 30 35

Thr Glu Asn Glu Thr Phe Cys Arg Ala Ala 40 45

Thr Val Leu Arg Gln Phe Tyr Ser His His 50 55

Glu Lys Asp Thr Arg Cys Leu Gly Ala Thr 60 65

Ala Gln Gln Phe His Arg His Lys Gln Leu 70 75

Ile Arg Phe Leu Lys Arg Leu Asp Arg Asn 80 85

Leu Trp Gly Leu Ala Gly Leu Asn Ser Cys 90 95

Pro Val Lys Glu Ala Asn Gln Ser Thr Leu 100 105

Glu Asn Phe Leu Glu Arg Leu Lys Thr Ile 110 115

Met Asp Glu Lys Asp Ser Lys Cys Ser Ser 120 125

- (2) INFORMATION FOR SEQ ID NO: 8:
- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 131 amino acids
 - (B) TYPE: amino acid
 - (D) TOPOLOGY: linear
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 8:

Met Ala His Lys Cys Asp Ile Thr Leu Gln Glu 1 5

Ile Ile Lys Thr Leu Asn Ser Leu Thr Glu
10 15

Gln Lys Thr Leu Cys Thr Glu Leu Thr Val 20 25

Thr Asp Ile Phe Ala Ala Ser Lys Asn Thr 30 35

Thr Glu Asn Glu Thr Phe Cys Arg Ala Ala 40 45

Thr Val Leu Arg Gln Phe Tyr Ser His His 50 55

Glu Lys Asp Thr Arg Cys Leu Gly Ala Thr 60 65

Ala Gln Gln Phe His Arg His Lys Gln Leu 70 75

Ile Arg Phe Leu Lys Arg Leu Asp Arg Asn 80 85

Leu Trp Gly Leu Ala Gly Leu Asn Ser Cys 90 95

Pro Val Lys Glu Ala Asn Gln Ser Thr Leu 100 105

Glu Asn Phe Leu Glu Arg Leu Lys Thr Ile 110 115

Met Asp Glu Lys Asp Asp Lys Cys Ser Ser 120 125

- (2) INFORMATION FOR SEQ ID NO: 9:
- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 131 amino acids
 - (B) TYPE: amino acid
 - (D) TOPOLOGY: linear
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 9:

Met Ala His Lys Cys Asp Ile Thr Leu Gln Glu
1 5

Ile Ile Lys Thr Leu Asn Ser Leu Thr Ġlu 10 15

Gln Lys Thr Leu Cys Thr Glu Leu Thr Val 20 25

Thr Asp Ile Phe Ala Ala Ser Lys Asn Thr 30 35

Thr Glu Asn Glu Thr Phe Cys Arg Ala Ala 40 45

Thr Val Leu Arg Gln Phe Tyr Ser His His 50 55

Glu Lys Asp Thr Arg Cys Leu Gly Ala Thr 60 65

Ala Gln Gln Phe His Arg His Lys Gln Leu 70 75

Ile Arg Phe Leu Lys Arg Leu Asp Arg Asn 80 85

Leu Trp Gly Leu Ala Gly Leu Asn Ser Cys 90 95

Pro Val Lys Glu Ala Asn Gln Ser Thr Leu 100 105

Glu Asn Phe Leu Glu Arg Leu Lys Thr Ile 110 115

Met Arg Glu Lys Asp Asp Lys Cys Ser Ser 120 125

- (2) INFORMATION FOR SEQ ID NO: 10:
- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 131 amino acids
 - (B) TYPE: amino acid
 - (D) TOPOLOGY: linear
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 10:

Met Ala His Lys Cys Asp Ile Thr Leu Gln Glu
1 5

Ile Ile Lys Thr Leu Asn Ser Leu Thr Glu
10 15

Gln Lys Thr Leu Cys Thr Glu Leu Thr Val 20 25

Thr Asp Ile Phe Ala Ala Ser Lys Asn Thr 30 35

Thr Glu Asn Glu Thr Phe Cys Arg Ala Ala 40 45

Thr Val Leu Arg Gln Phe Tyr Ser His His 50 55

Glu Lys Asp Thr Arg Cys Leu Gly Ala Thr
60 65

Ala Gln Gln Phe His Arg His Lys Gln Leu 70 75

Ile Arg Phe Leu Lys Arg Leu Asp Arg Asn 80 85

Leu Trp Gly Leu Ala Gly Leu Asn Ser Cys 90 95



Pro Val Lys Glu Ala Asn Gln Ser Thr Leu 100 105

Glu Asn Phe Leu Glu Arg Leu Lys Thr Ile 110 115

Met Asp Glu Lys Tyr Asp Lys Cys Ser Ser 120 125

- (2) INFORMATION FOR SEQ ID NO: 11:
- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 130 amino acids
 - (B) TYPE: amino acid
 - (D) TOPOLOGY: linear
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 11:

Met His Lys Cys Asp Ile Thr Leu Gln Glu
1 5

Ile Ile Lys Thr Leu Asn Ser Leu Thr Glu
10 15

Gln Lys Thr Leu Cys Thr Glu Leu Thr Val 20 25

Thr Asp Ile Phe Ala Ala Ser Lys Asp Thr 30 35

Thr Glu Asn Glu Thr Phe Cys Arg Ala Ala 40 45

Thr Val Leu Arg Gln Phe Tyr Ser His His 50 55

Glu Lys Asp Thr Arg Cys Leu Gly Ala Thr 60 65

Ala Gln Gln Phe His Arg His Lys Gln Leu 70 75

Ile Arg Phe Leu Lys Arg Leu Asp Arg Asn 80 85

Leu Trp Gly Leu Ala Gly Leu Asn Ser Cys 90 95

Pro Val Lys Glu Ala Asp Gln Ser Thr Leu 100 105

Glu Asn Phe Leu Glu Arg Leu Lys Thr Ile 110 115

Met Arg Glu Lys Asp Ser Lys Cys Ser Ser 120 125

- (2) INFORMATION FOR SEQ ID NO: 12:
- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 130 amino acids
 - (B) TYPE: amino acid
 - (D) TOPOLOGY: linear
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 12:

Met His Lys Cys Asp Ile Thr Leu Gln Glu 1 5

Ile Ile Lys Thr Leu Asn Ser Leu Thr Glu
10 15

Gln Lys Thr Leu Cys Thr Glu Leu Thr Val 20 25

Thr Asp Ile Phe Ala Ala Ser Lys Asp Thr 30 35

Thr Glu Asn Glu Thr Phe Cys Arg Ala Ala 40 45

Thr Val Leu Arg Gln Phe Tyr Ser His His 50 55

Glu Lys Asp Thr Arg Cys Leu Gly Ala Thr

Ala Gln Gln Phe His Arg His Lys Gln Leu 70 75

Ile Arg Phe Leu Lys Arg Leu Asp Arg Asn 80 85

Leu Trp Gly Leu Ala Gly Leu Asn Ser Cys 90 95

Pro Val Lys Glu Ala Asp Gln Ser Thr Leu 100 105 Glu Asn Phe Leu Glu Arg Leu Lys Thr Ile 110 115

Met Asp Glu Lys Asp Ser Lys Cys Ser Ser 120 125

- (2) INFORMATION FOR SEQ ID NO: 13:
- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 130 amino acids
 - (B) TYPE: amino acid
 - (D) TOPOLOGY: linear
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 13:

Met His Lys Cys Asp Ile Thr Leu Gln Glu
1 5

Ile Ile Lys Thr Leu Asn Ser Leu Thr Glu
10 15

Gln Lys Thr Leu Cys Thr Glu Leu Thr Val 20 25

Thr Asp Ile Phe Ala Ala Ser Lys Asp Thr

Thr Glu Asn Glu Thr Phe Cys Arg Ala Ala 40 45

Thr Val Leu Arg Gln Phe Tyr Ser His His 50 55

Glu Lys Asp Thr Arg Cys Leu Gly Ala Thr 60 65

Ala Gln Gln Phe His Arg His Lys Gln Leu 70 75

Ile Arg Phe Leu Lys Arg Leu Asp Arg Asn 80 85

Leu Trp Gly Leu Ala Gly Leu Asn Ser Cys 90 95

Pro Val Lys Glu Ala Asp Gln Ser Thr Leu 100 105

Glu Asn Phe Leu Glu Arg Leu Lys Thr Ile 110 115

Met Asp Glu Lys Asp Asp Lys Cys Ser Ser 120 125

- (2) INFORMATION FOR SEQ ID NO: 14:
- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 130 amino acids
 - (B) TYPE: amino acid
 - (D) TOPOLOGY: linear
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 14:

Met His Lys Cys Asp Ile Thr Leu Gln Glu 1 5

Ile Ile Lys Thr Leu Asn Ser Leu Thr Glu
10 15

Gln Lys Thr Leu Cys Thr Glu Leu Thr Val 20 25

Thr Asp Ile Phe Ala Ala Ser Lys Asp Thr 30 35

Thr Glu Asn Glu Thr Phe Cys Arg Ala Ala 40 45

Thr Val Leu Arg Gln Phe Tyr Ser His His 50 55

Glu Lys Asp Thr Arg Cys Leu Gly Ala Thr 60 65

Ala Gln Gln Phe His Arg His Lys Gln Leu 70 75

Ile Arg Phe Leu Lys Arg Leu Asp Arg Asn 80 85

Leu Trp Gly Leu Ala Gly Leu Asn Ser Cys 90 95

Pro Val Lys Glu Ala Asp Gln Ser Thr Leu 100 105

Glu Asn Phe Leu Glu Arg Leu Lys Thr Ile 110 115 Met Arg Glu Lys Asp Asp Lys Cys Ser Ser 120 125

- (2) INFORMATION FOR SEQ ID NO: 15:
- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 130 amino acids
 - (B) TYPE: amino acid
 - (D) TOPOLOGY: linear
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 15:

Met His Lys Cys Asp Ile Thr Leu Gln Glu
1 5

Ile Ile Lys Thr Leu Asn Ser Leu Thr Glu
10 15

Gln Lys Thr Leu Cys Thr Glu Leu Thr Val 20 25

Thr Asp Ile Phe Ala Ala Ser Lys Asp Thr 30 35

Thr Glu Asn Glu Thr Phe Cys Arg Ala Ala 40 45

Thr Val Leu Arg Gln Phe Tyr Ser His His 50 55

Glu Lys Asp Thr Arg Cys Leu Gly Ala Thr 60 65

Ala Gln Gln Phe His Arg His Lys Gln Leu 70 75

Ile Arg Phe Leu Lys Arg Leu Asp Arg Asn 80 85

Leu Trp Gly Leu Ala Gly Leu Asn Ser Cys 90 95

Pro Val Lys Glu Ala Asp Gln Ser Thr Leu 100 105

Glu Asn Phe Leu Glu Arg Leu Lys Thr Ile 110 115 Met Asp Glu Lys Tyr Asp Lys Cys Ser Ser 120 125

- (2) INFORMATION FOR SEQ ID NO: 16:
- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 129 amino acids
 - (B) TYPE: amino acid
 - (D) TOPOLOGY: linear
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 16:
- His Lys Cys Asp Ile Thr Leu Gln Glu
 1 5
- Ile Ile Lys Thr Leu Asn Ser Leu Thr Glu
 10 15
- Gln Lys Thr Leu Cys Thr Glu Leu Thr Val 20 25
- Thr Asp Ile Phe Ala Ala Ser Lys Asn Thr 30 35
- Thr Glu Asn Glu Thr Phe Cys Arg Ala Ala 40 45
- Thr Val Leu Arg Gln Phe Tyr Ser His His 50
- Glu Lys Asp Thr Arg Cys Leu Gly Ala Thr 60 65
- Ala Gln Gln Phe His Arg His Lys Gln Leu
 70 75
- Ile Arg Phe Leu Lys Arg Leu Asp Arg Asn 80 85
- Leu Trp Gly Leu Ala Gly Leu Asn Ser Cys 90 95
- Pro Val Lys Glu Ala Asn Gln Ser Thr Leu 100 105
- Glu Asn Phe Leu Glu Arg Leu Lys Thr Ile 110 115
- Met Arg Glu Lys Asp Ser Lys Cys Ser Ser 120 125

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- (2) INFORMATION FOR SEQ ID NO: 18:(i) SEQUENCE CHARACTERISTICS:(A) LENGTH: 129 amino acids
 - (B) TYPE: amino acid(D) TOPOLOGY: linear
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 18:

His Lys Cys Asp Ile Thr Leu Gln Glu 1 5

Ile Ile Lys Thr Leu Asn Ser Leu Thr Glu
10 15

Gln Lys Thr Leu Cys Thr Glu Leu Thr Val 20 25

Thr Asp Ile Phe Ala Ala Ser Lys Asn Thr 30 35

Thr Glu Asn Glu Thr Phe Cys Arg Ala Ala 40 45

Thr Val Leu Arg Gln Phe Tyr Ser His His 50 55

Glu Lys Asp Thr Arg Cys Leu Gly Ala Thr 60 65

Ala Gln Gln Phe His Arg His Lys Gln Leu
70 75

Ile Arg Phe Leu Lys Arg Leu Asp Arg Asn 80 85

Leu Trp Gly Leu Ala Gly Leu Asn Ser Cys 90 95

Pro Val Lys Glu Ala Asn Gln Ser Thr Leu 100 105

Glu Asn Phe Leu Glu Arg Leu Lys Thr Ile 110 115

Met Asp Glu Lys Asp Asp Lys Cys Ser Ser 120 125

(2) INFORMATION FOR SEQ ID NO: 19:(i) SEQUENCE CHARACTERISTICS:



(2) INFORMATION FOR SEQ ID NO: 17: (i) SEQUENCE CHARACTERISTICS:										
(A) LENGTH: 129 amino acids (B) TYPE: amino acid										
(D) TOPOLOGY: linear (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 17:										17:
His 1	Lys	Cys	Asp	Ile 5	Thr	Leu	Gln	Glu		
Ile 10	Ile	Lys	Thr	Leu	Asn 15	Ser	Leu	Thr	Glu	
Gln 20	Lys	Thr	Leu	Cys	Thr 25	Glu	Leu	Thr	Val	
Thr 30	Asp	Ile	Phe	Ala	Ala 35	Ser	Lys	Asn	Thr	
Thr 40	Glu	Asn	Glu	Thr	Phe 45	Cys	Arg	Ala	Ala	
Thr 50	Val	Leu	Arg	Gln	Phe 55	Tyr	Ser	His	His	
Glu 60	Lys	Asp	Thr	Arg	Cys 65	Leu	Gly	Ala	Thr	
Ala 70	Gln	Gln	Phe	His	Arg 75	His	Lys	Gln	Leu	
Ile 80	Arg	Phe	Leu	Lys	Arg 85	Leu	Asp	Arg	Asn	
Leu 90	Trp	Gly	Leu	Ala	Gly 95	Leu	Asn	Ser	Cys	
Pro 100	Val	Lys	Glu	Ala	Asn 105	Gln	Ser	Thr	Leu	
Glu 110	Asn	Phe	Leu	Glu	Arg 115	Leu	Lys	Thr	Ile	
Met 120	Asp	Glu	Lys	Asp	Ser 125	Lys	Cys	Ser	Ser	
					()			



- (A) LENGTH: 129 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear
- (xi) SEQUENCE DESCRIPTION: SEQ ID NO: 19:
- His Lys Cys Asp Ile Thr Leu Gln Glu
 1 5
- Ile Ile Lys Thr Leu Asn Ser Leu Thr Glu
 10 15
- Gln Lys Thr Leu Cys Thr Glu Leu Thr Val 20 25
- Thr Asp Ile Phe Ala Ala Ser Lys Asn Thr 30 35
- Thr Glu Asn Glu Thr Phe Cys Arg Ala Ala 40 45
- Thr Val Leu Arg Gln Phe Tyr Ser His His 50 55
- Glu Lys Asp Thr Arg Cys Leu Gly Ala Thr 60 65
- Ala Gln Gln Phe His Arg His Lys Gln Leu 70 75
- Ile Arg Phe Leu Lys Arg Leu Asp Arg Asn 80 85
- Leu Trp Gly Leu Ala Gly Leu Asn Ser Cys 90 95
- Pro Val Lys Glu Ala Asn Gln Ser Thr Leu 100 105
- Glu Asn Phe Leu Glu Arg Leu Lys Thr Ile 110 115
- Met Arg Glu Lys Asp Asp Lys Cys Ser Ser 120 125
 - (2) INFORMATION FOR SEO ID NO: 20:
- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 129 amino acids
 - (B) TYPE: amino acid

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(D) TOPOLOGY: linear
(xi) SEQUENCE DESCRIPTION: SEQ ID NO: 20:

His Lys Cys Asp Ile Thr Leu Gln Glu 1 5

Ile Ile Lys Thr Leu Asn Ser Leu Thr Glu 10 15

Gln Lys Thr Leu Cys Thr Glu Leu Thr Val 20 25

Thr Asp Ile Phe Ala Ala Ser Lys Asn Thr 30 35

Thr Glu Asn Glu Thr Phe Cys Arg Ala Ala 40 45

Thr Val Leu Arg Gln Phe Tyr Ser His His 50 55

Glu Lys Asp Thr Arg Cys Leu Gly Ala Thr 60 65

Ala Gln Gln Phe His Arg His Lys Gln Leu 70 75

Ile Arg Phe Leu Lys Arg Leu Asp Arg Asn 80 85

Leu Trp Gly Leu Ala Gly Leu Asn Ser Cys 90 95

Pro Val Lys Glu Ala Asn Gln Ser Thr Leu 100 105

Glu Asn Phe Leu Glu Arg Leu Lys Thr Ile 110 115

Met Asp Glu Lys Tyr Asp Lys Cys Ser Ser 120 125